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|-----------------|-------------|----------------------|---------------------|
| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
| 09/421,217      | 10/20/99    | TAKAHASHI            | H 0057-2533-2Y      |

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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
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2811  
DATE MAILED: 04/24/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

09/421,217

Applicant(s)

TAKAHASHI, HIDEKI

Examiner

Steven Loke

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 4/12/01.
- 2a) ☐ This action is FINAL.
- 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 22-39 is/are pending in the application.
- 4a) Of the above claim(s) 27-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 08/566,572.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.

- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

Application/Control Number: 09/421,217  
Art Unit: 2811

Applicant's election with traverse of Group I, claims 22-26 in Paper No. 7 is acknowledged. The traversal is on the ground(s) that the Restriction Requirement has failed to show any evidence of the materiality of forming a conductive control electrode only on the insulating film without removing the conductor. This is not found persuasive because the examiner has shown a different method to form the device of the claimed invention. The examiner has shown an example that recite material differences. It is also urged that the burden on the Examiner would be minimal when the search and examination of an entire application being done at the same time. Since the two distinct inventions would require a search of two different classes, there would be serious burden on the examiner.

The requirement is still deemed proper and is therefore made FINAL.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22, 24 and 26 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hagino.

Hagino shows all the elements of the claimed invention in fig. 5. It is an insulated gate semiconductor device, comprises: a first semiconductor layer [1] of a first conductivity type (p) having first and second main surfaces on opposite sides thereof; a second semiconductor layer [3] of a second conductivity type (n) provided on the first main surface of the first semiconductor layer; a third semiconductor layer [12] of the second conductivity type higher in an impurity concentration (n+) and thinner than the second semiconductor layer [3], and provided on a surface of the second semiconductor layer; a fourth semiconductor layer [4] of the first conductivity type provided on a side surface of the third semiconductor layer [12]; a fifth semiconductor layer [5] of the second conductivity type selectively provided in a surface of the fourth semiconductor layer [4] and opposing the third semiconductor layer [12] through the fourth semiconductor layer [4]; a first main electrode [9] disposed across and connected with surfaces of the fourth and fifth semiconductor layers [4, 5]; a second main electrode [10] provided on the second main surface of the first semiconductor layer [1]; an insulating film [7] provided on a portion of the fourth semiconductor layer [4] interposed between the third and fifth semiconductor layers [12, 5]; a control electrode [8] facing the portion through the insulating film [7] so that the portion forms a channel region [6]; a sixth semiconductor layer [2] of the second conductivity type higher in an impurity concentration (n+) than the second semiconductor layer [3] provided between the first

and second semiconductor layers [1, 3]; the first main electrode [9] is not contacting any other semiconductor layer than the fourth and fifth semiconductor layers [4, 5].

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagino in view of Clark et al.

Hagino differs from the claimed invention by not showing the second semiconductor layer extends through the first semiconductor layer and is partially exposed in the second main surface of the first semiconductor layer.

Clark et al. shows an anode structure comprises a second semiconductor layer [11, 13] extends through the first semiconductor layer [12] and is partially exposed in the second main surface of the first semiconductor layer [12] in fig. 1.

Since both Hagino and Clark et al. teach a drift region in an insulated gate bipolar transistor, it would have been obvious to have the anode structure of Clark et al. in Hagino because it reduces the on-resistance of the device.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hagino.

It would have been obvious for the sixth semiconductor layer extends through the first semiconductor layer and is partially exposed in the second main surface of the first semiconductor layer because it depends on the switching speed of the device.

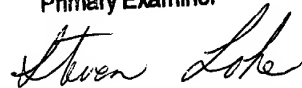
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (703) 308-4920. The examiner can normally be reached on 7:45 am to 5:15 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

sl  
April 22, 2001

Steven Loke  
Primary Examiner

A handwritten signature in cursive script that reads "Steven Loke".